UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/232,265	01/19/1999	JARNO KNUUTILA	460-008437-U	2021

7590 06/16/2005

CLARENCE A. GREEN
PERMAN & GREEN
425 POST ROAD
FAIRFIELD, CT 06430

EXAMINER	
MISLEH, JUSTIN P	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/232,265	KNUUTILA ET AL.	
	Examiner	Art Unit	
	Justin P. Misleh	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 3 - 7, 9 - 11, 13, 16, 19, 21 - 37, and 44 - 64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3 - 7, 9 - 11, 13, 16, 19, 21 - 37, and 44 - 64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 16 February 2005 have been fully considered but they are not persuasive; albeit, Applicant's arguments with respect to Claims 62 – 64 have been considered but are moot in view of the new grounds of rejection.

2. Applicant argues, "Neither Sanemitsu's IC card nor Koppa's expansion card are integrated in their respective host devices as a component of the host device, rather they are peripheral/additional devices that can be connected to the host and used in connection with the host device ... they are separate devices, not integrated components of the host."

3. In response to Applicant arguments, it is initially noted that the Examiner relied upon Sanemitsu to teach the above-recited claim features. Additionally, Applicant has not specifically claimed that the devices are inseparable or cannot be detached from one another. Rather, the amended independent claims at least require the camera module being integrated in the electronic device as a component of the electronic device.

4. As supported by the interpretations of one with ordinary skill in art and dictionary definitions, the claim phrases "integrated" and "component" DO NOT require, explicitly or implicitly, that the devices are inseparable or cannot be detached from one another. More specifically, *The American Heritage® Dictionary of the English Language, Fourth Edition (Copyright © 2000 by Houghton Mifflin Company)* defines:

- **Integrate**
  1. To make into a whole by bringing all parts together; unify.

2.

a. To join with something else; unite.

b. To make part of a larger unit: *integrated the new procedures into the work routine.*

- **Component**

1. A constituent element, as of a system.
2. A part of a mechanical or electrical complex.

5. As shown in figures 3, 4, and 6 of Sanemitsu, the IC card (8) makes the system (notebook-sized computer) whole by bringing all parts (display 22, speaker 26, and IC card 8) together such that images captured by the IC card (8) can be displayed on the display (22) on the notebook-sized computer. In Sanemitsu, the IC card (8) is in fact a part of a mechanical and electrical complex because the notebook-sized computer has a slot (23) for mechanically integrating the IC card (8) and the IC card (8) has a connector (101) for electrically integrating the notebook-sized computer. Thus, Sanemitsu discloses the camera module (8) being integrated in the electronic device (notebook-sized computer) as a component of the electronic device (notebook-sized computer).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 1, 7, and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanemitsu in view of Köppä.

8. For **Claim 1**, Sanemitsu disclose, as shown in figures 1 – 3 and as stated in columns 3 (lines 4 – 67) and 4 (lines 1- 5), a method for transferring image information from a camera module (IC card 8) to an electronic device (notebook-sized computer), the camera module (IC card 8) being integrated in the electronic device (the IC card 8 is completely integrated in the notebook-sized computer serving as the electronic device, as shown in figure 3) as a component of the electronic device (see Examiner's response above), the method comprising the steps of:

forming an image in the camera module (IC card 8) by means of an image sensor (Photoelectric Converter Device 10) comprising pixels which convert light to which the pixels are exposed into an analog signal,

converting said analog signal into digital image information by analog-to-digital conversion (Image Encoder 12), and

transferring the digital image information from the camera module (IC card 8) to the electronic device (notebook-sized computer; see column 3, lines 4 - 28).

While Sanemitsu disclose a camera module comprised of an IC card (8) that is fully integrated in an electronic device comprised of a notebook-sized computer (figure 3) and the transferring of digital image information from the camera module (IC card 8) to the electronic device (notebook-sized computer), Sanemitsu is silent with respect to the details of the transferring. More specifically, Sanemitsu does not disclose transferring the digital image information from the camera module to the electronic device via an internal serial connection bus of the electronic device.

However, Köppä also disclose an IC card that is fully integrated in an electronic device. More specifically, Köppä discloses, as shown in figure 2B and as stated in columns 4 (lines 39 – 44) and 7 (lines 25 – 34), an expansion card (1) that is fully integrated in an electronic device (2). Furthermore Köppä teaches the details of transferring digital information from the expansion card (1) to the electronic device (2). Köppä states, "data is transferred between the expansion card [1] and the electronic device [2] in serial form via a simple data line [23]. The electronic device [2] and the expansion card [1], preferably the control unit [11], [12], are provided with means (not shown) for implementing data transmission in serial form, known as such."

As stated in Köppä, at the time the invention was made, one with ordinary skill in the art would have been motivated to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of transferring image information from a camera module to an electronic device, disclosed by Sanemitsu, as a means to provide "data transmission in serial form [with the] advantage that fewer data transmission lines (data lines) will be required (usually one or two) than in data transmission in parallel form," thereby reducing manufacturing costs. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of transferring image information from a camera module to an electronic device, disclosed by Sanemitsu.

9. For **Claim 7**, Sanemitsu disclose, as shown in figures 1 – 3 and as stated in columns 3 (lines 4 – 67) and 4 (lines 1- 5), a camera module (IC card 8) to be used as an integrated component (see Examiner's response above) of an electronic device (notebook-sized computer;

IC card 8 is completely integrated in the notebook-sized computer serving as the electronic device, as shown in figure 3), the camera module (IC card 8) comprising an image sensor (Photoelectric Converter Device 10) with pixels for conducting photoelectric conversion, and an analog-to-digital converter (Image Encoder 12) for conversion of an analog signal generated by said pixels into digital image information, the camera module (IC card 8) comprising:

a connection circuit (1) for transferring digital image information to the electronic device and for receiving control information from the electronic device (notebook-sized computer; see column 3, lines 4 - 28).

While Sanemitsu disclose a camera module comprised of an IC card (8) that is fully integrated in an electronic device comprised of a notebook-sized computer (figure 3) and the transferring of digital image information from the camera module (IC card 8) to the electronic device (notebook-sized computer), Sanemitsu is silent with respect to the details of the transferring and the type of connection circuit. More specifically, Sanemitsu does not disclose transferring the digital image information from the camera module to the electronic device via an internal serial connection bus of the electronic device.

However, Köppä also disclose an IC card that is fully integrated in an electronic device. More specifically, Köppä discloses, as shown in figure 2B and as stated in columns 4 (lines 39 – 44) and 7 (lines 25 – 34), an expansion card (1) that is fully integrated in an electronic device (2). Furthermore Köppä teaches the details of transferring digital information from the expansion card (1) to the electronic device (2). Köppä states, "data is transferred between the expansion card [1] and the electronic device [2] in serial form via a simple data line [23]. The electronic

device [2] and the expansion card [1], preferably the control unit [11], [12], are provided with means (not shown) for implementing data transmission in serial form, known as such."

As stated in Köppä, at the time the invention was made, one with ordinary skill in the art would have been motivated to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu, as a means to provide "data transmission in serial form [with the] advantage that fewer data transmission lines (data lines) will be required (usually one or two) than in data transmission in parallel form," thereby reducing manufacturing costs. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu.

10. For **Claim 13**, Sanemitsu disclose, as shown in figures 1 – 3 and as stated in columns 3 (lines 4 – 67) and 4 (lines 1- 5), a mobile station (notebook-sized computer), comprising a camera module (IC card 8) integrated as a component of the mobile station (see Examiner's response above), the camera module (IC card 8) comprising an image sensor (Photoelectric Converter Device 10) with pixels for conducting photoelectric conversion, and an analog-to-digital converter (Image Encoder 12) for conversion of an analog signal generated by said pixels into digital image information, and a connection circuit (1) for transferring digital image information to the mobile station (notebook-sized computer), the mobile station comprising an internal connection bus for transferring digital image information form the camera module (IC

card 8) to the mobile station (notebook-sized computer) and for transferring control information from the electronic device (notebook-sized computer; see column 3, lines 4 - 28) to the camera module (IC card 8).

While Sanemitsu disclose a camera module comprised of an IC card (8) that is fully integrated in an electronic device comprised of a notebook-sized computer (figure 3) and the transferring of digital image information from the camera module (IC card 8) to the electronic device (notebook-sized computer), Sanemitsu is silent with respect to the details of the transferring and the type of connection circuit. More specifically, Sanemitsu does not disclose transferring the digital image information from the camera module to the electronic device via an internal serial connection bus of the electronic device.

However, Köppä also disclose an IC card that is fully integrated in an electronic device. More specifically, Köppä discloses, as shown in figure 2B and as stated in columns 4 (lines 39 – 44) and 7 (lines 25 – 34), an expansion card (1) that is fully integrated in an electronic device (2). Furthermore Köppä teaches the details of transferring digital information from the expansion card (1) to the electronic device (2). Köppä states, "data is transferred between the expansion card [1] and the electronic device [2] in serial form via a simple data line [23]. The electronic device [2] and the expansion card [1], preferably the control unit [11], [12], are provided with means (not shown) for implementing data transmission in serial form, known as such."

As stated in Köppä, at the time the invention was made, one with ordinary skill in the art would have been motivated to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu, as a

means to provide "data transmission in serial form [with the] advantage that fewer data transmission lines (data lines) will be required (usually one or two) than in data transmission in parallel form," thereby reducing manufacturing costs. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu.

11. **Claims 3 – 5, 9 – 11, 16, 21 – 29, 31 – 37, and 44 – 61** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanemitsu in view of Köppä in further view of Endsley et al. (US 6,005,613).

12. As for **Claims 45, 47, and 49**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

On the other hand, Endsley et al. also disclose a camera module that is connected to an electronic device via a serial connection. More specifically, Endsley et al. disclose, as shown in figure 1 and as stated in columns 3 (lines 6 – 67), 4 (lines 36 – 40 and 60 – 64), 5 (lines 3 – 67), 6 (lines 3 – 67), and 7 (lines 28 – 43), transferring image information from the camera module (analog section 22 and digital section 23) to the electronic device (host computer 12 including

USB Host I/F 14 and computer monitor 16) wherein the digital image information transfer to the electronic device is performed via a serial connection (USB). Furthermore, Endsley et al. teach that the digital image information is transferred to the electronic device under the control of the electronic device (see column 4, lines 60 – 67, and column 5, lines 1 and 2, the host computer controls the camera-picture process ...) and that the camera module is adapted to operate in either one of a normal photographic mode (single-shot mode) and a viewfinder mode (see Examiner's explanation below; continuous capture mode), wherein when operating in viewfinder mode the camera module reduces the quantity of digital image information to be transferred from the camera module to the electronic device compared with the quantity of digital image information that is transferred when the camera operates in normal photographic mode. As clearly stated in column 6 (lines 35 – 41), there are two modes of operation including a continuous capture (viewfinder) lower resolution mode and a single-shot (normal photographic) full resolution mode.

Endsley et al. does not specifically label a viewfinder mode; however one does in-fact exist. As asserted by Endsley et al. in describing the prior art (see column 1, lines 37 – 49) a motion mode is used to provide a preview image on a LCD viewfinder prior to still mode capture. Hence, a motion mode is a *viewfinder mode*. The claim language as presently claimed by the Applicant simply requires a *viewfinder mode* and a *normal photographic mode* and as defined above both are clearly taught by Endsley et al. continuous capture mode and single-shot capture mode. The continuous capture mode provides preview images, which can be recorded as permanent images, on the monitor and the single-shot capture mode allows the user to capture those very same images and others not viewed by the continuous capture mode. Moreover,

Endsley et al. state, in column 6 (lines 45 – 54), that the user can hold the camera while viewing the computer monitor display to create a motion sequence for videoconferencing, or in order to frame a person, object, or document to be captured.

As indicated throughout Endsley et al., at the time the invention was made, one with ordinary skill in the art would have been motivated to include features that adapt a camera module to operate in either one of a normal photographic mode and a viewfinder mode, wherein when operating in viewfinder mode the camera module reduces the quantity of digital image information to be transferred from the camera module to the electronic device compared with the quantity of digital image information that is transferred when the camera operates in normal photographic mode, as taught by Endsley et al., in the camera module, as shown by Sanemitsu in view of Köppä, as a means to ensure a continuous and consistent image frame rate on a limited bandwidth connection using a particular method of transfer image information. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include features that adapt a camera module to operate in either one of a normal photographic mode and a viewfinder mode, wherein when operating in viewfinder mode the camera module reduces the quantity of digital image information to be transferred from the camera module to the electronic device compared with the quantity of digital image information that is transferred when the camera operates in normal photographic mode, as taught by Endsley et al., in the camera module, as shown by Sanemitsu.

13. As for **Claims 3, 9, and 50**, Endsley et al. disclose, as stated in column 5 (lines 55 – 66), that reduction of the quantity of digital image information to be transferred from the camera module is conducted by adjusting the conversion accuracy of the analog to digital conversion.

The reduction of the quantity of digital image information (lowering of the resolution) is conducted by adjusting the conversion accuracy of the sampling of each color pixel. In the continuous capture (viewfinder) lower resolution mode, the number of bits per pixel sample is reduced from 8 bits to 4 bits, thereby reducing the color depth at each pixel and reducing the overall resolution of the image. The reduction from 8 bits to 4 bits is reducing the conversion accuracy of the analog to digital conversion.

14. As for **Claims 4, 10, and 51**, Endsley et al. disclose, as stated in column 6 (lines 35 – 41), that the reduction of the quantity of information to be transferred from the camera module is conducted by reducing the resolution of the image. Endsley et al. teach that there are two modes of operation including a continuous capture (viewfinder) lower resolution mode and a single-shot (normal photographic) full resolution mode; thereby the lower resolution mode is a reduction of the resolution of the image.

15. As for **Claims 5, 11, and 52**, Endsley et al. disclose, as stated in column 5 (lines 55 – 66), that the adjustment reduction of the resolution of the image is conducted by under-sampling of the digital image information. Endsley et al. teach of horizontal and vertical sub-sampling for every color.

16. As for **Claim 16**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

On the other hand, Endsley et al. also disclose a camera module that is connected to an electronic device via a serial connection. More specifically, Endsley et al. disclose, as shown in figure 1 and as stated in columns 3 (lines 6 – 67), 4 (lines 36 – 40 and 60 – 64), 5 (lines 3 – 67), 6 (lines 3 – 67), and 7 (lines 28 – 43), transferring image information from the camera module (analog section 22 and digital section 23) to the electronic device (host computer 12 including USB Host I/F 14 and computer monitor 16) wherein the digital image information transfer to the electronic device is performed via a serial connection (USB). Endsley et al. disclose, as stated in column 4 (lines 36 – 40), that said external connection bus (USB 42) comprises a serial bus ("stream" pipe) and a control serial bus ("one pipe for transporting control data to the camera") and that the mobile station is adapted to transfer control information to the camera module via said control serial bus ("one pipe for transporting control data to the camera") and to receive digital image information from the camera module in serial form via said serial bus ("stream pipe").

As indicated throughout Endsley et al., at the time the invention was made, one with ordinary skill in the art would have been motivated to include features wherein the digital image information transfer to the electronic device is performed via a serial connection and that the transfer of digital image information from the camera module to the electronic device is started responsive to a control signal received from the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä, as a means to ensure a continuous and consistent image frame rate on a limited bandwidth connection using a particular method of transfer image information. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include features wherein

the digital image information transfer to the electronic device is performed via a serial connection and that the transfer of digital image information from the camera module to the electronic device is started responsive to a control signal received from the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä.

17. As for **Claims 21, 31, and 53**, Endsley et al. disclose, as stated in columns 4 (lines 60 – 64), 5 (lines 3 – 13), and 6 (lines 62 – 68), that the camera module is set into viewfinder mode responsive to a control signal received from the electronic device. The operational modes of the camera can be adjusted from the host computer insofar as the host computer provides camera parameters representative of at least two operational camera modes (the continuous capture viewfinder mode and the single-shot capture normal photographic mode) to govern the camera's actions in each of the operational modes. The camera parameters are stored in registers (72) within the camera's microprocessor (38). Therefore, since the camera parameters governing the operation of the continuous capture viewfinder mode are provided by the host computer and stored in the camera's microprocessor registers, the viewfinder mode is set responsive to a control signal (comprised of camera parameters) received from the electronic device.

18. As for **Claims 22, 32, and 54**, Endsley et al. disclose, as stated in columns 4 (lines 60 – 64), 5 (lines 3 – 13), and 6 (lines 62 – 68), that the camera module is set into normal photographic mode responsive to a control signal received from the electronic device. The operational modes of the camera can be adjusted from the host computer insofar as the host computer provides camera parameters representative of at least two operational camera modes (the continuous capture viewfinder mode and the single-shot capture normal photographic mode)

to govern the camera's actions in each of the operational modes. The camera parameters are stored in registers (72) within the camera's microprocessor (38). Therefore, since the camera parameters governing the operation of the single-shot capture normal photographic mode are provided by the host computer and stored in the camera's microprocessor registers, the normal photographic mode is set responsive to a control signal (comprised of camera parameters) received from the electronic device.

19. As for **Claims 23, 33, 44, 46, 48, and 55**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

On the other hand, Endsley et al. also disclose a camera module that is connected to an electronic device via a serial connection. More specifically, Endsley et al. disclose, as shown in figure 1 and as stated in columns 3 (lines 6 – 67), 4 (lines 36 – 40 and 60 – 64), 5 (lines 3 – 67), 6 (lines 3 – 67), and 7 (lines 28 – 43), transferring image information from the camera module (analog section 22 and digital section 23) to the electronic device (host computer 12 including USB Host I/F 14 and computer monitor 16) wherein the digital image information transfer to the electronic device is performed via a serial connection (USB). Endsley et al. disclose, as stated in columns 3 (lines 9 – 16) and 4 (lines 6 – 10 and 36 – 40), that the transfer of digital image information from the camera module to the electronic device is started responsive to a control

signal received from the electronic device. Endsley et al. teach that data is transferred between the electronic device (host computer) and camera module by means of USB. Each transaction (exchange of data) begins when the electronic device sends a USB packet to the camera module. In addition, Endsley et al. teach that the camera module USB interface has one pipe for transporting control data to the camera module and another pipe for transporting image data from the camera module.

As indicated throughout Endsley et al., at the time the invention was made, one with ordinary skill in the art would have been motivated to include features that allow transfer of digital image information from the camera module to the electronic device responsive to a control signal received from the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä, as a means to increase the flexibility in user selection of the operation modes of camera module while the functionality of user-controlled switches, e.g. the shutter button, remains fixed. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include features that allow transfer of digital image information from the camera module to the electronic device responsive to a control signal received from the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä.

20. As for **Claims 24, 34, and 56**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an

electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

On the other hand, Endsley et al. also disclose a camera module that is connected to an electronic device via a serial connection. More specifically, Endsley et al. disclose, as shown in figure 1 and as stated in columns 3 (lines 6 – 67), 4 (lines 36 – 40 and 60 – 64), 5 (lines 3 – 67), 6 (lines 3 – 67), and 7 (lines 28 – 43), transferring image information from the camera module (analog section 22 and digital section 23) to the electronic device (host computer 12 including USB Host I/F 14 and computer monitor 16) wherein the digital image information transfer to the electronic device is performed via a serial connection (USB). Endsley et al. disclose, as stated in column 4 (lines 60 – 64), that the camera module takes a picture responsive to a control signal received from the electronic device. Endsley et al. teach that the electronic device (host computer) controls the camera picture-taking process by instructing the camera when to take still or motion pictures.

As indicated throughout Endsley et al., at the time the invention was made, one with ordinary skill in the art would have been motivated to include features that allow the camera module to take a picture responsive to a control signal received from the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä, as a means to increase the flexibility in user selection of the operation modes of camera module while the functionality of user-controlled switches, e.g. the shutter button, remains fixed. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include features that allow the camera module to take a picture

responsive to a control signal received from the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä.

21. As for **Claims 25, 35, and 57**, Endsley et al. disclose, as stated in column 5 (lines 55 – 66), that reduction of the quantity of digital image information to be transferred from the camera module is conducted by leaving less significant bits of the digital image information un-transferred. As stated above, Endsley et al. teach that the reduction of the quantity of digital image information to be transferred from the camera module can be conducted by adjusting the conversion accuracy of the analog to digital conversion. The reduction of the quantity of digital image information (lowering of the resolution) is conducted by adjusting the conversion accuracy of the sampling of each color pixel. In the continuous capture (viewfinder) lower resolution mode, the number of bits per pixel sample is reduced from 8 bits to 4 bits, thereby reducing the color depth at each pixel and reducing the overall resolution of the image and in-fact leaving less significant bits of the digital information to be transferred un-transferred.

22. As for **Claims 26, 36, and 58**, Endsley et al. disclose, as shown in figure 1 and as stated in column 5 (lines 55 – 66), that the camera module captures an image with maximum resolution (images are always captured at a the imager resolution of 640 x 480) and reduces the quantity of digital image information to be transferred at the stage when the digital image information is transferred to the electronic device (digital section 30 is the stage when the digital information is transferred). Endsley et al. teach that a reduction of the quantity of digital image information takes place in the static ram memory (34).

23. As for **Claims 27 and 61**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring

digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

On the other hand, Endsley et al. also disclose a camera module that is connected to an electronic device via a serial connection. More specifically, Endsley et al. disclose, as shown in figure 1 and as stated in columns 3 (lines 6 – 67), 4 (lines 36 – 40 and 60 – 64), 5 (lines 3 – 67), 6 (lines 3 – 67), and 7 (lines 28 – 43), transferring image information from the camera module (analog section 22 and digital section 23) to the electronic device (host computer 12 including USB Host I/F 14 and computer monitor 16) wherein the digital image information transfer to the electronic device is performed via a serial connection (USB). Endsley et al. disclose, as shown in figure 1, that an image is displayed on a display (computer monitor 16) of the electronic device (host computer).

As indicated throughout Endsley et al., at the time the invention was made, one with ordinary skill in the art would have been motivated to include features that display an image on the display of the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä, as a means to preview the image prior to image processing. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include features that display an image on the display of the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä.

24. As for **Claims 28, 37, and 59**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

On the other hand, Endsley et al. also disclose a camera module that is connected to an electronic device via a serial connection. More specifically, Endsley et al. disclose, as shown in figure 1 and as stated in columns 3 (lines 6 – 67), 4 (lines 36 – 40 and 60 – 64), 5 (lines 3 – 67), 6 (lines 3 – 67), and 7 (lines 28 – 43), transferring image information from the camera module (analog section 22 and digital section 23) to the electronic device (host computer 12 including USB Host I/F 14 and computer monitor 16) wherein the digital image information transfer to the electronic device is performed via a serial connection (USB). Endsley et al. disclose, as stated in column 5 (lines 48 – 54), that the camera module crops a region from an image and transfers the digital image information of the cropped region to the electronic device. The operational modes of the camera can be adjusted from the host computer insofar as the host computer provides camera parameters representative of at least two operational camera modes (the continuous capture viewfinder mode and the single-shot capture normal photographic mode) to govern the camera's actions in each of the operational modes. The camera parameters are stored in registers (72) within the camera's microprocessor (38). Of the plurality of camera parameters, a crop value parameter provides starting and ending lines and pixels to crop the image before it is

transferred to the electronic device. Performing a crop on the image thereby reduces the amount of data that has to be sent to the electronic device (host computer).

As indicated throughout Endsley et al., at the time the invention was made, one with ordinary skill in the art would have been motivated to include features that allow the camera module to crop a region from an image and transfers the digital image information of the cropped region to the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä, as a means to ensure a continuous and consistent image frame rate on a limited bandwidth connection using a particular method of transfer image information. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include features that allow the camera module to crop a region from an image and transfers the digital image information of the cropped region to the electronic device, as taught by Endsley et al., in the camera module and electronic device, as shown by Sanemitsu in view of Köppä.

25. As for **Claim 29 and 60**, Endsley et al. disclose, that the electronic device sends information about the region of the image to be cropped to the camera module. As stated above, the crop value parameter provided by the electronic device (host computer) provides starting and ending lines and pixels to crop the image before it is transferred to the electronic device.

26. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sanemitsu in view of Köppä in view of Endsley et al. in further view of Miyake.

27. As for **Claim 6**, Sanemitsu in view of Köppä in view of Endsley et al. show, at least in combination, that the reduction of the quantity of information to be transferred from the camera

module is conducted by reducing the resolution of the image. However, Endsley et al. do not disclose that the resolution of the image is restored in the electronic device; the resolution is restored by interpolation from the received digital image information. Miyake disclose, as shown in figure 1 and as stated in columns 4 (lines 65 and 66), 5 (lines 55 – 61), and 11 (lines 37 – 52), a method, that can be incorporated into an electronic device, in which the resolution of a low resolution image (input at 100) is restored into a high resolution image (output at 106). As stated in column 11 (lines 31 – 36), at the time the invention was made, one with ordinary skill in the art would have been motivated to include the method of restoring the resolution of a low resolution image as taught by Miyake in the electronic device of Endsley et al. as means to provide a clear jag-less high quality output image even based on an original image of which information quantity is low. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included the method of restoring the resolution of a low resolution image as taught by Miyake in the electronic device of Endsley et al.

28. **Claims 19 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanemitsu in view of Köppä in further view of Hsieh et al.

29. As for **Claims 19 and 30**, Sanemitsu in view of Köppä were combined to teach that it would have been obvious to one with ordinary skill in the art to apply the details of transferring digital information from the expansion card to the electronic device, as taught by Köppä, to the method of and apparatus for transferring image information from a camera module to an

electronic device, disclosed by Sanemitsu. However, the combined teaching of Sanemitsu in view of Köppä is silent with regard to the operation of camera module and the electronic device.

Hsieh et al. also disclose, as shown in figure 5 and as stated in columns 5 (lines 55 – 59), 6 (lines 27 – 47), 9 (lines 40 – 44), and 10 (lines 30 – 35), a camera module (110) connected to an electronic device/mobile station (120) for transferring digital image information (via USB 119). Hsieh et al. also disclose transferring digital image information from the camera module (110) to the electronic device/mobile station (120) via a network of electronic devices/mobile stations (100').

As stated in column 10 (lines 30 – 35), at the time the invention was made one with ordinary skill in the art would have been motivated to transfer digital image information from the camera module to the electronic device/mobile station via a network of electronic devices/mobile stations as taught by Hsieh et al. in the camera module/electronic device/mobile station of Endsley et al. as a means to share electronic devices/mobile stations among multiple camera modules. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to transfer digital image information from the camera module to the electronic device/mobile station via a network of electronic devices/mobile stations as taught by Hsieh et al. in the camera module/electronic device/mobile station of Sanemitsu in view of Köppä.

30. **Claims 62 – 64** are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. in view of Aruga et al.

31. For **Claim 62**, Harris et al. disclose, as shown in figures 1, 8, 12, and 13 and as stated in columns 2 (lines 55 – 65), 4 (lines 24 – 60), 5 (lines 37 – 67), 6 (lines 1 and 2), a method for transferring image information from a camera module (user interface 123) to an electronic device (communications device 104), the camera module (user interface 123) being a non-removable, integrated component of the electronic device (via swivel 190), the method comprising the steps of:

forming an image in the camera module (user interface 123) by means of an image sensor (CCD camera 188) comprising pixels which convert light to which the pixels are exposed into an analogue signal,

converting said analogue signal into digital image information by analogue-to-digital conversion (Although not specifically stated in Harris et al., the presence of DSP 152 connected to the output of the IR channel modem 160 indicates that the image formed in the camera module 123 and transferred via IR channel modem 172 is a digital image signal), and

transferring the digital image information from the camera module (123) to the electronic device via an internal connection (IR channel modems 160 and 172) of the electronic device (104).

Harris et al. disclose that the camera module (123) transfers digital image information to the electronic device (104) via an internal IR channel (170) using internal IR channel modems (160 and 172); however, Harris et al. does not specify whether the internal IR connection is a serial bus connection.

On the other hand, Aruga et al. also disclose a method for transferring image information from a camera module to an electronic device. More specifically, Aruga et al. teach, as shown in

figure 2 and as stated in column 3 (lines 26 – 37), a digital camera (CA) serving as a camera module connected to an external storage device (OM) serving as an electronic device via cable (10) serving as a serial interface bus. Thus, Aruga et al. teach transferring digital image information from a camera module to an electronic device via a serial connection bus.

At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included transferring digital image information from a camera module to an electronic device via a serial connection bus, as taught by Aruga et al., in the method for transferring digital image information, disclosed by Harris et al., for the advantage of providing an inexpensive bus that minimizes crosstalk between electrical components which supports high-speed asynchronous and isochronous format data transfers.

32. For **Claim 63**, Harris et al. disclose, as shown in figures 1, 8, 12, and 13 and as stated in columns 2 (lines 55 – 65), 4 (lines 24 – 60), 5 (lines 37 – 67), 6 (lines 1 and 2), a camera module (user interface 123) being used as a non-removable, integrated component of an electronic device (104; via swivel 190), the camera module (123) comprising an image sensor (CCD camera 188) with pixels for conducting photoelectric conversion, and an analogue-to-digital converter for conversion of an analogue signal generated by said pixels into digital image information (Although not specifically stated in Harris et al., the presence of DSP 152 connected to the output of the IR channel modem 160 indicates that the image formed in the camera module 123 and transferred via IR channel modem 172 is a digital image signal), the camera module (123) further comprising a connection circuit (IR channel 170) for transferring digital image information to the electronic device (104) and for receiving control information (via IR channel

168) from the electronic device (104) via internal connection (IR channel modems 160 and 172) of the electronic device (104).

Harris et al. disclose that the camera module (123) transfers digital image information to the electronic device (104) via an internal IR channel (170) using internal IR channel modems (160 and 172); however, Harris et al. does not specify whether the internal IR connection is a serial bus connection.

On the other hand, Aruga et al. also disclose a method for transferring image information from a camera module to an electronic device. More specifically, Aruga et al. teach, as shown in figure 2 and as stated in column 3 (lines 26 – 37), a digital camera (CA) serving as a camera module connected to an external storage device (OM) serving as an electronic device via cable (10) serving as a serial interface bus. Thus, Aruga et al. teach transferring digital image information from a camera module to an electronic device via a serial connection bus.

At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included transferring digital image information from a camera module to an electronic device via a serial connection bus, as taught by Aruga et al., in the camera module and electronic device, disclosed by Harris et al., for the advantage of providing an inexpensive bus that minimizes crosstalk between electrical components which supports high-speed asynchronous and isochronous format data transfers.

33. For **Claim 64**, Harris et al. disclose, as shown in figures 1, 8, 12, and 13 and as stated in columns 2 (lines 55 – 65), 4 (lines 24 – 60), 5 (lines 37 – 67), 6 (lines 1 and 2), a mobile station (100), comprising a camera module (user interface 123) integrated as a non-removable component of an electronic device (104; via swivel 190), the camera module (123) comprising

an image sensor (CCD camera 188) with pixels for conducting photoelectric conversion, and an analogue-to-digital converter for conversion of an analogue signal generated by said pixels into digital image information (Although not specifically stated in Harris et al., the presence of DSP 152 connected to the output of the IR channel modem 160 indicates that the image formed in the camera module 123 and transferred via IR channel modem 172 is a digital image signal), and a connection circuit (IR channel 170) for transferring digital image information formed by the camera module (123 via CCD camera 118) to the mobile station (100), the mobile station further comprising a connection circuit (IR channel 170) for transferring digital image information to the mobile station (100) and for receiving control information (via IR channel 168) from the mobile station (100) via internal connection (IR channel modems 160 and 172) of the electronic device (104).

Harris et al. disclose that the camera module (123) transfers digital image information to the electronic device (104) via an internal IR channel (170) using internal IR channel modems (160 and 172); however, Harris et al. does not specify whether the internal IR connection is a serial bus connection.

On the other hand, Aruga et al. also disclose a method for transferring image information from a camera module to a mobile station. More specifically, Aruga et al. teach, as shown in figure 2 and as stated in column 3 (lines 26 – 37), a digital camera (CA) serving as a camera module connected to an external storage device (OM) serving as a mobile station via cable (10) serving as a serial interface bus. Thus, Aruga et al. teach transferring digital image information from a camera module to a mobile station via a serial connection bus.

At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included transferring digital image information from a camera module to an mobile station via a serial connection bus, as taught by Aruga et al., in the camera module and mobile station, disclosed by Harris et al., for the advantage of providing an inexpensive bus that minimizes crosstalk between electrical components which supports high-speed asynchronous and isochronous format data transfers.

Cited Prior Art

34. The prior art made of record and not relied upon (Wilska et al. and Jacobsen et al.) is considered pertinent to Applicant's disclosure because each discloses a camera module connected to an electronic device wherein the electronic device comprises a mobile station and wherein the camera module transfers images captured therein to the mobile station.

Conclusion

35. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

36. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 571.272.7313. The Examiner can normally be reached on Monday through Thursday from 7:30 AM to 5:00 PM and on alternating Fridays from 8:00 AM to 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Wendy R Garber can be reached on 571.272.7308. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
June 10, 2005

AUNG MOE
PRIMARY EXAMINER